Roundabouts with Nantucket In Mind

A report for the Nantucket Select Board
Submitted by
The Nantucket Historical Commission
February 5, 2020

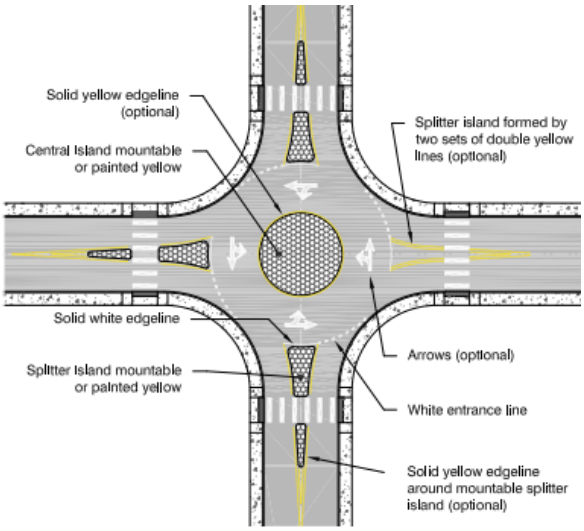

Figure 6: Sample Pavement Marking Plan for a Mini-Roundabout

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Nantucket is an island without traffic lights, and intends to stay that way. To ease traffic, Nantucket's transportation department favors roundabouts as a method of intersection control. The 2020 Transportation Improvement Plan recommends roundabouts at eight island intersections.

These large, expensive street designs make a significant mark on our National Historic Landmark. The Nantucket Historical Commission has researched roundabouts in order to recommend an aesthetic approach that will be harmonious with the historic context of Nantucket, while remaining responsive to Federal Highway Administration (FHWA) roundabout guidelines. This briefing paper comprises our recommendations, which can be summarized with four key points.

- Mini roundabouts are an attractive alternative to larger modern roundabouts.
- Cost, aesthetics, and land-use are measures of efficiency that enhance the case for mini roundabouts.
- Signage should be kept to a minimum
- Materials and landscaping should harmonize with our historic and natural context.

Rotaries vs. Roundabouts, Modern and Mini

Roundabouts are designed to deflect and slow down traffic, and are yield controlled at all approaches. Nantucket has **one** true functioning roundabout, located at Sparks Ave and Hooper Farm Road. The Milestone Rotary is not a roundabout, because it does not deflect and slow traffic on Orange Street/ Old South Road. Traffic approaches at high speed, while traffic on Sparks Ave must come to a full stop, rather than yield. This slows throughput and can result in traffic backing up to the Hooper Farm / Sparks Ave roundabout.

Roundabouts can be described as either a "modern roundabout" or "mini roundabout". A modern roundabout is greater than 90' in total inscribed diameter, and has a raised, non-traversable center island. Its larger diameter accommodates a greater volume of cars, and the radius of the travel lanes must be large enough for trucks. A mini roundabout is between 50' – 90'. The center island is slightly raised or domed, and designed for very large trucks to drive over at slow speeds.

Nantucket has one true roundabout, at Sparks Ave and Hooper Farm Road

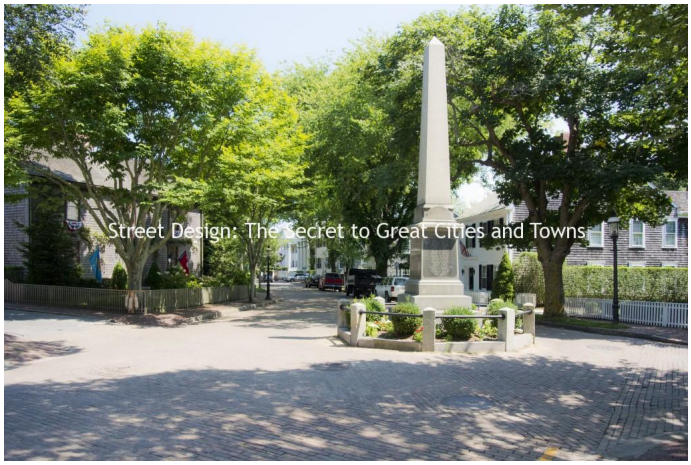
Considering Mini Roundabouts

The 2020 Transportation Improvement Plan (TIP) includes eight proposed roundabouts. All but one are modern roundabouts with raised center islands, similar to the one at Sparks Ave and Hooper Farm Road. An alternative approach is the mini roundabout, a smaller version of the modern roundabout. The mini roundabout was developed in the United Kingdom for use in towns and urban centers. Mini roundabouts are used successfully in historic towns across Germany, the UK, and France. They are beginning to be used in the US, and have been studied and recommended by the FHWA.

On Nantucket, scale is of utmost importance. In the case of buildings, a larger volume can be achieved more successfully through additive massing, rather than building larger single structures. Similarly, scale is important in street design – our streets contribute to our status as a National Historic Landmark. As architect Catherine Garland points out: *Nantucket roads were built for simple purposes and wagon transportation. Some of the most delightful paths on the island are those narrow, curving rural lanes leading out of the main town….Each memorable path forms the stage for the interplay of people, architecture, and nature.*

Times change and Nantucket is no longer a simple, quiet place. But in responding to growth, Nantucket's planners should seek out ways to include the scale the island was first designed for, and employ forms that are harmonious with the existing context.

The NHC believes mini-roundabouts, which are smaller versions of modern roundabouts, can be styled to fit naturally on Nantucket. Nantucket has numerous small "squares," unconventional traffic circles, and areas where streets come together irregularly. Examples include the Civil War monument, Caton Circle, and the five corners intersection. A mini-roundabout is reminiscent of these more spacious nodes, but provides a structure necessary for efficient traffic flow. While they are less common in the US, mini-roundabouts are used successfully in historic settings all over the UK and Ireland. They are reminiscent of street patterns that evolved over time in early towns.



Nantucket has numerous small "squares," unconventional traffic circles, and areas where streets come together irregularly. This "node" is not compliant with modern road design. But it is a physical and emotional gateway to the historic town, and is quintessentially Nantucket.

How Mini Roundabouts Work

A mini roundabout is similar to a modern roundabout in design but with an inscribed circle of 50 – 90 feet and a fully traversable flush or domed (up to 5" elevation) center island. Splitter islands are typically used, but can be either raised, mountable, or flush (painted). Due to its small size, a mini-roundabout can often fit in an existing intersection with minimal need for taking of land.

Mini roundabouts are 50-90 feet across, with a fully traversable center, which can be domed or cobbled. This is an example of a mini roundabout in Germany.

A properly designed mini-roundabout has the safety, traffic flow, and environmental benefits of a larger roundabout, but is smaller in size. The smaller diameter works because large vehicles can still pass through, over the traversable center island. In all cases, a mini-roundabout is yield controlled and designed to deflect incoming traffic, forcing vehicles to slow down in order to navigate the circle. Raised splitter islands can assist in the forced slowing of traffic.

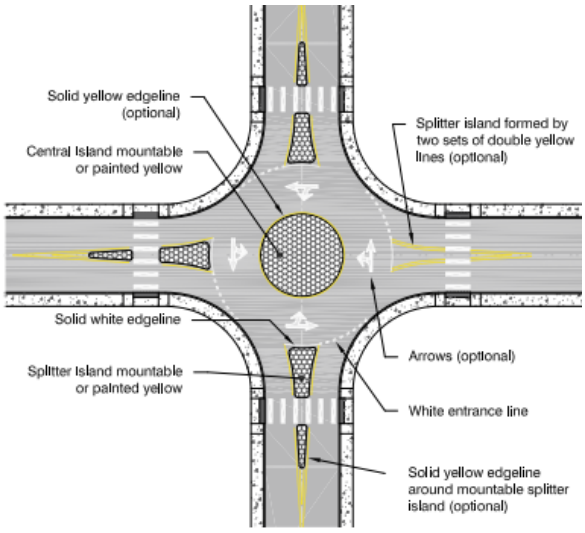


Figure 6: Sample Pavement Marking Plan for a Mini-Roundabout

Because of a mini roundabout's small size, crosswalks are placed similarly to traditional intersections. This avoids the long and confusing pedestrian crossings associated with larger roundabouts.

Pedestrians

The small size of a mini-roundabout allows pedestrians to avoid the long and confusing crossings associated with larger roundabouts. Approaching vehicles must slow down, look for pedestrians and other vehicles, and stop if there are pedestrians in the crosswalk or vehicles in the traffic circle.

Central Islands and Ornamentation

A mini-roundabout on Nantucket could have a domed but traversable surface of cobblestone or Belgian Block. This is consistent with the urban and rural plan of the island and would blend in easily.

One challenge of modern roundabouts with raised, planted center islands is they take up much more land than an intersection, but exist only for traffic control. The center island is lost space without utility beyond channeling cars. Nantucket should stay looking distinctively Nantucket, which means taking design cues from the historic town and natural setting. We recommend caution regarding ornamenting the natural landscape with pocket parks and decorated center islands, which can appear contrived. A natural setting with native vegetation might be more appropriate, attractive, and easy to maintain.

Cost

Mini-roundabouts are much less expensive to construct than modern roundabouts. Nantucket's 2020 Transportation plan proposes a mini-roundabout at Old South Road and Amelia Drive, at an estimated construction cost of $233,972; compared to $2 million for a modern roundabout just down the street at Fairgrounds and OSR.

Exceptions

Mini-roundabouts are not recommended everywhere. According to the Federal Highway Administration, travel speeds should be 30-35mph or less. If expected volume exceeds 15,000 cars per day, a detailed capacity analysis is necessary to project operations. Note that this is not a firm limit. Rather, it's a guideline for traffic planners. The number of approaches and overall project goals must be considered. Decreasing wait times are one priority; aesthetics, land use, and cost are also priorities.

Conclusion

1. When altering the network of Nantucket streets, planners take into account the history and distinctive visual quality of the island. Scale is critically important and informs the feeling of the built environment and Nantucket's "special visual quality".

2. There are examples on Nantucket of both small "traffic circles" (Caton Circle, The Civil War Monument on Main Street, the Sconset rotary) and large irregular intersections (five corners, four corners). While these do not function as roundabouts, they are visual models that help make mini-roundabouts make sense.

3. The FHWA recommends mini-roundabouts for space-constrained areas with lower speeds and volumes. The NHC believes mini-roundabouts are well suited to many areas on Nantucket. When a roundabout is the preferred intersection control, the Nantucket Historical Commission recommends the use of mini-roundabouts.

4. There may be instances where capacity analyses show traffic will flow faster, at peak times, around a larger modern roundabout than around a mini roundabout, because the larger circle allows more vehicles to circulate at once.
Importantly, we recommend the Select Board consider that while decreasing wait times is one priority, aesthetics, land use, and cost are also priorities. It may be that minimizing wait times at peak is not always the dominant priority, when all factors are considered.

5. Regardless of the type of roundabout, the NHC recommends limiting signage as is the case at the Sparks Ave roundabout. The landscape plan should be responsive to Nantucket's natural landscape, and should be reviewed by the NHC and or HDC as plans are developed.

Please contact NHC@nantucket-ma.gov with questions and comments.

Sources

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